HARVESTING HAY WITH THE SWEEP-RAKE

A MEANS BY WHICH EASTERN HAY-GROWERS MAY SAVE LABOR

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THE SWEEP-RAKE offers the possibility of reducing by about 50 per cent the labor required in harvesting hay compared with the methods now commonly used in the East. This implement is used most extensively in the hay-growing sections of the West, but is entirely practicable under conditions prevailing in many eastern sections.

It is comparatively inexpensive and costs little for repairs.

It eliminates a great deal of irksome hand labor. With the sweep-rake a boy who can drive a team can do the same work as a man.

Many eastern hay-growers are unacquainted with the value of this tool, and the purpose of this bulletin is to bring it to their attention and urge its consideration as a means of relieving the shortage of farm labor.

HARVESTING HAY WITH THE SWEEP-RAKE.

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HAY GROWERS in the Eastern States in many cases might make a considerable saving in both time and irksome labor by using the sweep-rake, an implement which has been used very extensively on farms in the Middle West and West, but the possibilities of which have not been realized by the farmers in the States farther east, where much hay is still handled by the old and expensive method of pitching by hand. In fact, a large percentage of eastern farmers have never seen a sweep-rake and are entirely unacquainted with its use.

DESCRIPTION OF THE SWEEP-RAKE.

As can be seen from the illustrations, the sweep-rake consists of several long wooden teeth lying almost flat on the ground, pointed at one end and fastened to a strong framework at the other. The point frequently consists of a steel cap fitted over the end of the

FIG. 1.—A typical Eastern haying scene. The three men shown at the left of the picture should in one afternoon haul to the barn from cocks and place in the mow with a horse-fork from 6 to 8 tons of hay.

FIG. 2.—A sweep-rake at work. Two outfits of this kind, under the conditions shown in figure 1, should put in the mow, using slings, about 15 tons of hay per day.

tooth and shaped so as to prevent it from running into the ground under ordinary conditions, yet so as to slip under the hay, no matter whether lying in piles, windrows, or swaths. The teeth usually are about 8 feet long and placed approximately 1 foot apart. The total width of the rake ordinarily is about 12 feet, rakes of this width having 13 teeth. This gives a surface approximately 8 by 12 feet on which the hay can be loaded and carried. Some rakes are made larger than this for use with exceptionally large horses, or, in some cases, with four horses.

OPERATION.

The quantity of hay which can be loaded on a sweep depends somewhat upon the condition the hay is in, but principally on the

FIG. 3.—Large sweeps handle hay very rapidly. The four-horse outfit here shown carries about 1 ton per load.

skill of the driver and the strength of the horses. To use the sweep to best advantage heavy, powerful horses are necessary, that is, horses weighing 1,400 pounds or more, as it requires considerable power to push a sweep when gathering large loads (see fig. 3). A skillful driver with a good team of heavy horses will carry loads of from 800 to 1,000 pounds; where small horses are used the loads,

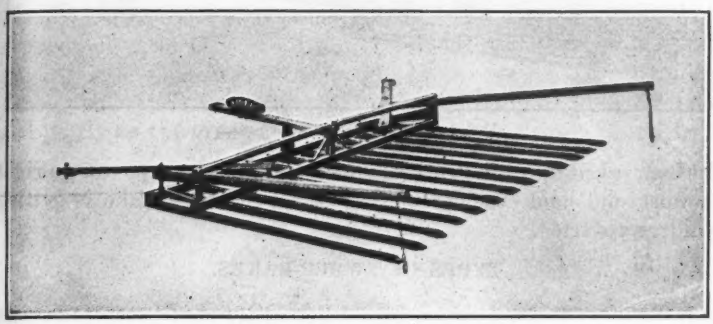

FIG. 4.—Wheelless sweep-rake.

of course, will be smaller, but never should run less than 500 pounds. Even where comparatively small loads are carried with the sweep, it will be found considerably quicker and cheaper than loading on a wagon by hand, except where the hay is hauled a long distance. Two men can work to advantage with sweep-rakes, while where a wagon is used three men are required to make an efficient crew.

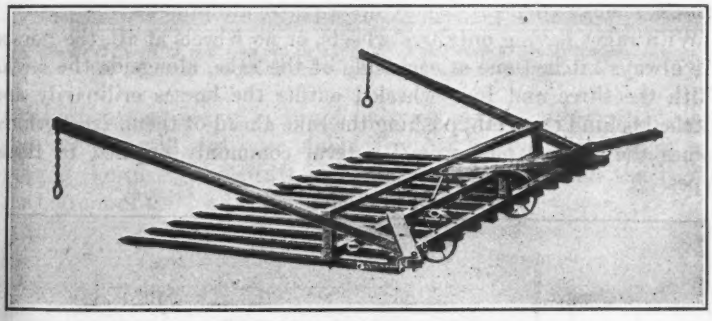

FIG. 5.—Two-wheeled sweep-rake.

While the sweep-rake sometimes is used to gather the hay from the swath and take it directly to the stack or barn, this practice is not common. However, it often proves of value in gathering hay directly from the swath and hauling to the stack or barn when a storm is threatening and the hay is ready to be put up but has not

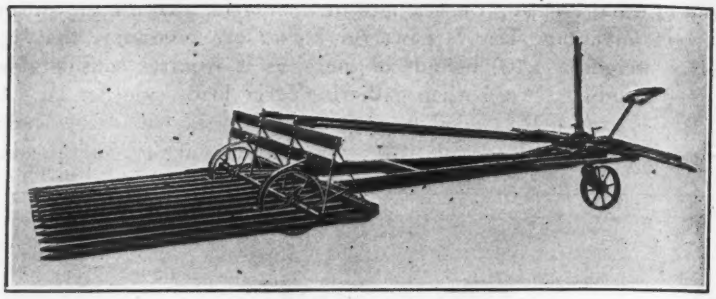

FIG. 6.—Three-wheeled sweep-rake.

yet been raked into windrows. In such a case the sweeps can go right to work and haul considerable hay while the horse rake is getting windrows started.

TYPES OF SWEEP-RAKES.

In figures 4 to 7 are shown four different types of sweep-rake—one with no wheels, one with two, one with three, and one with four wheels. Rakes of the wheelless type sometimes are called "go-devils." These are not well adapted for hauling hay through narrow lanes, barn lots, over rough or muddy ground, or into barns; as the load of hay can not be raised from the ground, but must be dragged, their usefulness is confined to hauling hay to the stack in the field. The same objection also applies, to some extent, to the two-wheeled type. The choice between the two, three, and four wheeled outfits for western use seems to depend largely upon personal opinion.

With rakes having only two wheels, or no wheels at all, the horses are always hitched one at each side of the rake, alongside the teeth. With the three and four wheeled outfits the horses ordinarily are hitched behind the teeth, pushing the rake ahead of them, from which comes the name "push-rake," a term commonly applied to these types.

FIG. 7.—Four-wheeled sweep-rake.

The three and four wheeled rakes have one feature not found in other types—i. e., the teeth may be raised from the ground after the hay has been loaded on them, thus lightening the draft in hauling the hay, as the weight is then carried entirely on the wheels instead of being partly dragged, as with the rakes having two or no wheels (see fig. 8.) This feature also prevents wasting the leaves and heads of the hay on the bottom of the load and the collecting of dirt. However, with the two-wheeled outfits it is possible to throw most of the weight on the wheels, since the load is counterbalanced, to a greater or less extent, by the weight of the operator. With rakes having no wheels the weight of the hay rests partly on the teeth and partly on the ground, thus making a comparatively heavy draft,

FIG. 8.—Front view of outfit shown in figure 2. The sweep is nearly loaded. When full the points of the teeth are raised about a foot from the ground.

although not so heavy as might be supposed, since the teeth act as sled runners and slip over stubbles rather easily. On bare or soft ground, however, the draft increases considerably, and the hay at the bottom of the load collects more or less dirt.

Since in the East nearly all the hay is hauled from the field to the barn, necessitating a somewhat longer haul on an average than in the West, where the hay usually is stacked in the field, the types of rake which permit lifting the hay from the ground when hauling are the most desirable. The two-wheeled and wheelless types therefore are not recommended for most eastern conditions.

When the horses are hitched behind the teeth and directly in front of the driver, as with most three and four wheeled rakes, it is somewhat easier for a novice to handle his team. With the experienced driver, however, this is of little importance, as he has no difficulty in

handling his team with the horses at the sides of the rake, and this hitch has the advantage of permitting turning more readily and in a smaller space than when the horses are behind the teeth.

HANDLING HAY AT THE BARN.

On most eastern farms the entire hay crop is stored in barns or hay sheds until baled, hauled to market, or fed. The typical eastern barn has one or more interior driveways from which the hay is unloaded from the wagon into the mows by means of hay forks or slings, although slings are not in common use. While the sweep-rake is not so convenient for use under these conditions as where hay is stacked in the field, it is entirely practicable. Care must be exercised to see that the entrance to the barn offers no place for the sweep-rake teeth to catch, either at the bottom or at the sides. If not much room is

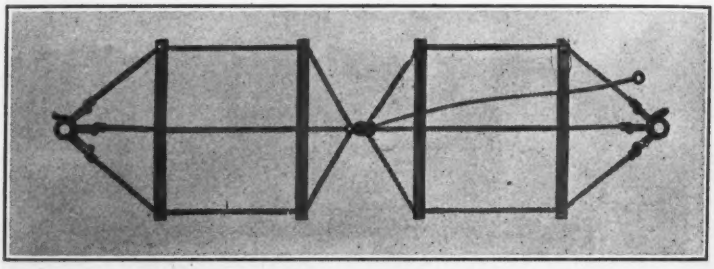

FIG. 9.—One type of hay-sling. The fastener at the middle is tripped by means of the small rope with the ring in the end. The trip-rope is fastened to this ring.

left at the sides of the sweep-rake when entering, it may be advisable to nail some boards or planks at each side to prevent the teeth from striking the sides of the doorway or other obstruction; if the planks are properly placed they will serve to guide the sweep into the location desired. In some cases it may be more practicable to unload the hay from the sweep to a sling just outside the barn entrance, allowing the tackle to drag the hay into the barn and raise it into the mow.

While ordinary hay-forks, or harpoons, sometimes are used to transfer sweep loads of hay into the mow, this practice is not recommended, as the hay as loaded on a sweep is not in proper shape to be handled satisfactorily in this way. A hay sling or "net" will be found much more satisfactory (see fig. 9). This is merely a sort of rope net made in two sections which are fastened together with a trip fastener.

The sling is spread out on the ground and the sweep-rake driven partly over it until the load of hay is squarely above the sling, when the teeth are dropped and the rake backed out from under the load,

leaving it on the sling. The two ends of the sling then are fastened to the rope used to raise the hay into the mow. In this way the entire sweep load is taken up at one load. When the fastener is released, the hay, which has been pressed tightly together by the sling, springs apart and is left in a loose heap, which is much more easily handled in the mow than hay which has been unloaded with a hay fork. Where a sling is being used outside a barn it may be found desirable to remove about 3 inches of dirt over a space the size of the sling so as to permit placing it below the level of the ground and prevent it getting pushed out of place when the sweep is driven over it in unloading the hay. It is also advisable to drive a few short pegs to hold the sling in place. When using a sling on a barn floor, as frequently would be desired in the East, a two or three inch plank should be beveled off on one edge so as to allow the sweep-rake teeth to slip over it. This plank should be nailed across the barn floor just in front of the place where the sling is to be placed.

TRAINING HORSES.

The work of horses on a sweep-rake is very different from that which most farm horses in the East ordinarily are required to do. Although some men state that they have trouble in teaching their horses to work properly with the sweep-rake, the fault is more with the driver than with the horses. The secret of success in getting horses to work satisfactorily with a sweep-rake is to drive with the lines and not with the voice. This is especially important when turning, as one horse must be kept going forward while the other slows down, stops, or even backs. Any instructions with the voice naturally confuse the horses in such a case, as they can not tell for which one the orders are meant. If the driver remains silent and merely holds back on the inside horse, allowing the other to go forward, the sweep will come around without difficulty or confusion. Backing should be avoided so far as possible, and it should never be necessary except when unloading the sweep; the rake should be kept moving forward at all times when loading, even when turning corners, as turns can be made much more easily while it is in motion than by turning with the center of the rake as a pivot, and keeping it moving forward prevents breaking the teeth.

EFFICIENCY AND ECONOMY OF THE SWEEP-RAKE.

The use of a sweep-rake in hauling hay from windrow to stack or barn under most eastern conditions can reasonably be expected to effect a reduction of 50 per cent in the cost of doing this work by the method now commonly used, i. e., pitching onto a wagon by hand and hauling to stack or barn. (See figs. 1 and 2.)

FIG. 10.—The sweep-rake is most efficient when used with a stacker. This picture shows a sweep-load of hay being delivered to an overshot stacker. The teeth have been lowered from the carrying position and are ready to be backed out from under the load.

Extensive investigations of the efficiency of various methods of handling hay, made by the Office of Farm Management, show that by the latter method two men pitching onto a wagon and one man loading usually will haul from 6½ to 8 tons of hay in one afternoon of six to seven hours. This will include putting the hay into the mow with the same crew, using hay fork or sling.

A two-man crew in the same length of time, using two sweep-rakes and four horses, with the average length of haul in the East, which is less than one-quarter of a mile, will haul to the barn and put into the mow with slings about double the amount of hay handled by the three-man crew working with a wagon; if the hay is stacked in the field, three times the amount will be handled, although the third man will be required on the stack. (See figs. 10 and 11.)

The amount of hay handled by any method will vary, of course, with conditions and yields; the figures given are fair averages for most conditions with a yield of about one and one-half tons per acre and where both men and horses are accustomed to the methods used.

The use of the sweep-rake not only eliminates hand labor in getting the hay from windrow to stack or barn, but does the work more quickly and cheaply than any other method now in common use. One of the greatest advantages is the reduction in the number of men required to put up hay where sweep-rakes are used, as good harvest hands usually are hard to get when needed and demand high wages. Furthermore, any boy who is capable of driving a team of horses can operate a sweep-rake and handle considerably more hay in a given time than a man pitching by hand. But the sweep-rake is valuable not only because of the direct saving it effects, but because the rapidity with which hay may be handled with it reduces loss

from storms, etc., to a minimum. It also has the advantage of being a comparatively inexpensive implement. Its popularity with the farmers who have used it would seem to warrant its more general use in the hay-growing sections of the East.

It is not the purpose of this bulletin to explain in detail the relative efficiency of the sweep-rake with different sized crews, i. e., different numbers of men and horses, nor to give detailed instructions concerning its operation, but merely to suggest to the eastern hay growers the possibility of using this implement to reduce the number of men necessary to handle their crop, or to permit handling it in less time, or both, thus allowing them to take advantage of the good weather during harvest time to a greater extent than at present, and to make them less dependent upon hired help for such work.

On many eastern farms only a small amount of grass is cut at one time because of the uncertainty of the weather and the fact that with the methods used the work of getting it into the barn after it is cured is slow compared with the time required for the other operations involved in haymaking. Where sweep-rakes are available a great deal more grass can be safely cut at one time because of the greater rapidity with which it can be put into the barn. It is believed the accompanying photographs, together with the facts given herein, will make apparent to men interested in this subject the possibilities of the sweep-rake for their own particular conditions.

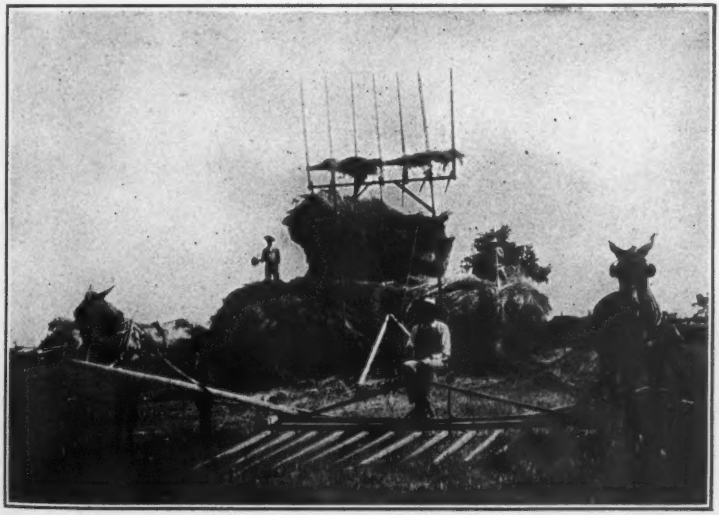

FIG. 11.—A sweep-load of hay dropping from an overshot stacker. The two-wheeled sweep-rake in the foreground, drawn by two mules and operated by a boy, will handle considerably more hay in a given period than two men pitching onto a wagon.

It is unnecessary to call attention to the fact that any saving which can be made in the expense of handling hay increases the net profit of the crop to that extent. While efficient use of both man and horse labor in farm operations always is important, it probably is more so during harvest than at any other season, partly because of the necessity of getting the work done during good weather and partly because of the scarcity and expensiveness of hired help at this time.

In those sections in which sweep-rakes are used the hay crop is handled at less than 50 per cent of the average cost of handling the hay crop in the East. That the sweep-rake is entirely practical and economical under eastern conditions has been demonstrated in a few isolated cases, where it has been used with very satisfactory results. It is recommended, therefore, that hay growers in the East, particularly those raising a considerable acreage of this crop, give careful consideration to the possibility of reducing the cost of handling their hay by means of the sweep-rake.

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